UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/787,097	06/27/2001	Jonathan S. Duke-Cohan	00530-089002	1296

7590 07/15/2003

Fish & Richardson
225 Franklin Street
Boston, MA 02110-2804

EXAMINER
HADDAD, MAHER M

ART UNIT	PAPER NUMBER
1644	

DATE MAILED: 07/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/787,097	DUKE-COHAN ET AL.	
	Examiner	Art Unit	
	Maher M. Haddad	1644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 5/5/03 .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-46 is/are pending in the application.

4a) Of the above claim(s) 4,5,7-19, and 28-37 is/are withdrawn from consideration.

5)☒ Claim(s) 1-3 and 38-40 is/are allowed.

6)☒ Claim(s) 6, 20-27 and 41-46 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

RESPONSE TO APPLICANT'S AMENDMENT

1. Applicant's amendment, filed 5/5/03 (Paper No. 11), is acknowledged.

2. Claims 1-46 are pending.

3. Claims 4-5, 7-19, and 28-37 stand withdrawn from further consideration by the Examiner, 37 C.F.R. § 1.142(b) as being drawn to a nonelected invention.

4. Claims1-3, 6, 20-27, and 38-46 are under consideration in the instant application.

5. The following new grounds of rejections are necessitated by the amendment filed on 5/5/03, paper No. 11.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 44-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A. Claims 44-45 are indefinite in the recitation of "amino acid sequences that is at least 95%/98% identical to a sequence consisting of SEQ ID NO:13". It is noted that SEQ ID NO: 13 is a nucleic acid sequence. Therefore, it is unclear how one skilled in the art can compare homology of an amino acid sequence to a nucleic acid sequence.

8. In view of the amendment filed on 5/5/03 (Paper No. 11), only the following rejections are remained.

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 6, 24-27 and 41-46 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the isolated DNA sequence of SEQ ID NOs: 1, 11, 13 and 19 for detection assay; does not reasonably provide **enablement** for any isolated nucleic acid encoding a fusion protein comprising a first domain and a second domain, wherein the first domain comprises an amino acid sequence consisting of SEQ ID NO:12 or any "functional fragment" of the amino acid sequence and wherein the second domain comprises any "heterologous sequence" in claim 6, any isolated DNA comprising (a) a nucleic acid sequence that is at least 85%, 95% identical to a sequence consisting of SEQ ID NO: 13; or the complement of the nucleic acid sequence, wherein the nucleic acid sequence encodes a

polypeptide that enhances spreading of a macrophage or a monocyte in claims 41and 42 or any isolated DNA comprising (a) nucleic acid sequence that encodes a polypeptide consisting of an amino acid sequence that is at least 85%, 95% or 98% identical to a sequence consisting of SEQ ID NO:12, or the complement of the nucleic acid sequence, wherein the polypeptide enhances spreading of a macrophage or a monocyte. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Attwood (Science 2000; 290:471-473) teaches that "[i]t is presumptuous to make functional assignments merely on the basis of some degree of similarity between sequences. Similarly, Skolnick et al. (Trends in Biotech. 2000; 18(1):34-39) teach that the skilled artisan is well aware that assigning functional activities for any particular protein or protein family based upon sequence homology is inaccurate, in part because of the multifunctional nature of proteins (e.g., "Abstract" and "Sequence-based approaches to function prediction", page 34). Even in situations where there is some confidence of a similar overall structure between two proteins, only experimental research can confirm the artisan's best guess as to the function of the structurally related protein (see in particular "Abstract" and Box 2). Finally, even single amino acid differences can result in drastically altered functions between two proteins. For example, Metzler et al. (Nature Structural Biol. 1997; 4:527-531) show that any of a variety of single amino acid changes can alter or abolish the ability of CTLA4 to interact with its ligands CD80 and CD86 (e.g., summarized in Table 2). Thus it is unpredictable if any functional activity will be shared by two nucleotides/polypeptides having less than 100% identity over the full length of their sequences.

The specification does not teach and provide sufficient guidance as to which 15%, 5% or 2% of the polypeptide, which is encoded by the claimed isolated DNA would have been altered such that the resultant polypeptide would have retained the function of the starting polypeptide. Regarding functional fragment of a SEQ ID NO: 12, the specification does not provide sufficient guidance as to which fragments of SEQ ID NO:12 would share the biologically activity of SEQ ID NO: 12. It is recognized in the prior art that the function of a protein depends on the sequence of its amino acids in a certain pattern, conformation of the protein due to the amino acid sequence and the functional properties of the different parts of the protein. The specification does not teach which changes in the amino acid of SEQ ID NO:12 would not alter all the activities of polypeptide. Therefore, the specification fails to provide sufficient guidance as to which core structure of SEQ ID NO: 12 is essential for maintain its biological activity and which changes can be made in the structure of SEQ ID NO: 12 and still maintained the same function.

A person of skill in the art would not know which sequences are essential, which sequences are non-essential, and what particular sequence lengths identify essential sequences. There is insufficient guidance to direct a person of skill in the art to select particular sequences or sequence lengths as essential for enhancing the spreading of a macrophage or a monocyte. Without detailed direction as to which nucleic acid sequences are essential to the function of the encoded polypeptide, a person of skill in the art would not be able to determine without undue

experimentation which of the plethora of nucleic acid sequences encompassed by the instant claims would share the ability to enhance spreading of a macrophage or a monocyte of the encoded polypeptide of SEQ ID NO:12, other than the nucleic acid of SEQ ID NO:1, 11, 13 and 19.

Applicant's arguments, filed 5/5/03 (Paper No. 11), have been fully considered, but have not been found convincing.

Applicant argues that the amendment to claim 1 render the previous rejection moot. However, the following rejection is based and the newly added claims and the amended claim 6.

However, Applicant is relying upon certain biological activities and the disclosure of three species to support an entire genus. The claims as written encompass a broad genus of polypeptides with an unlimited number of possibilities with regard to the length of the polypeptide sequence.

11. Claims 6, 24-27 and 41-46 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant is in possession of an isolated DNA sequence of SEQ ID NOs: 1, 11, 13 and 19 for detection assay.

Applicant is not in possession of any isolated nucleic acid encoding a fusion protein comprising a first domain and a second domain, wherein the first domain comprises an amino acid sequence consisting of SEQ ID NO:12 or any "functional fragment" of the amino acid sequence and wherein the second domain comprises any "heterologous sequence" in claim 6, any isolated DNA comprising (a) a nucleic acid sequence that is at least 85%, 95% identical to a sequence consisting of SEQ ID NO: 13; or the complement of the nucleic acid sequence, wherein the nucleic acid sequence encodes a polypeptide that enhances spreading of a macrophage or a monocyte in claims 41and 42 or any isolated DNA comprising (a) nucleic acid sequence that encodes a polypeptide consisting of an amino acid sequence that is at least 85%, 95% or 98% identical to a sequence consisting of SEQ ID NO:12, or the complement of the nucleic acid sequence, wherein the polypeptide enhances spreading of a macrophage or a monocyte.

Applicant has disclosed only nucleic acid of SEQ ID NO: 1, 11, 13 and 19; therefore, the skilled artisan cannot envision all the contemplated nucleic acid sequence possibilities recited in the instant claims. Consequently, conception cannot be achieved until a representative description of the structural and functional properties of the claimed invention has occurred, regardless of the complexity or simplicity of the method. Adequate written description requires more than a mere statement that it is part of the invention. See *Fiers v. Revel*, 25 USPQ2d 1601, 1606 (CAFC1993). The Guidelines for the Examination of Patent Application Under the 35

U.S.C.112, ¶ 1"Written Description" Requirement make clear that the written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species disclosure of relevant, identifying characteristics, i.e., structure or other physical and or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the genus (Federal Register, Vol. 66, No. 4, pages 1099-1111, Friday January 5, 20001, see especially page 1106 3rd column).

Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the written description inquiry, whatever is now claimed." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed." (See Vas-Cath at page 1116.). Consequently, Applicant was not in possession of the instant claimed invention. See University of California v. Eli Lilly and Co. 43 USPQ2d 1398.

Applicant is directed to the Revised Interim Guidelines for the Examination of Patent Applications Under the 35 U.S.C. 112, ¶ 1 "Written Description" Requirement, Federal Register, Vol. 66, No. 4, pages 1099-1111, Friday January 5, 2001.

Applicant's arguments, filed 5/5/03 (Paper No. 11), have been fully considered, but have not been found convincing.

Applicant submits the while SEQ ID NO: 2, 10, and 18 are not true fragments of SEQ ID NO:12, nevertheless, they are informative with respect to fragments of attractin-2. Applicant argues that one of skill in the art would expect that SEQ ID NO: 2, 10, and 18 would have the activity.

However, Applicant is relying upon certain biological activities and the disclosure of three species to support an entire genus. The claims as written encompass a broad genus of polypeptides with an unlimited number of possibilities with regard to the length of the polypeptide sequence.

12. Claims 1-3 and 38-40 are allowable.

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

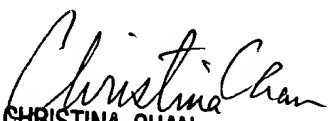
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maher Haddad, whose telephone number is (703) 306-3472. The examiner can normally be reached Monday to Friday from 8:00 to 4:30. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan can be reached at (703) 308-3973. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 1600 receptionist whose telephone number is (703) 308-0196.

Papers related to this application may be submitted to Technology Center 1600 by facsimile transmission. Papers should be faxed to Technology Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Fax Center telephone number is (703) 305-3014.

Maher Haddad, Ph.D.
Patent Examiner
Technology Center 1600
July 14, 2003



CHRISTINA CHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600